ENERGY ENGINEERING & MICROCOMPUTER APPLICATIONS **E N E R C O M P , Inc.**

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April 11, 2002

David K. Garman
Assistant Secretary, Energy Efficiency and Renewable Energy
United States Department of Energy
1000 Independence Avenue, SE
Washington, DC 20585

Re: **Energy Star Windows Criteria**
Importance of the Value of On-Peak Electrical Energy Use

Dear **Mr. Garman**:

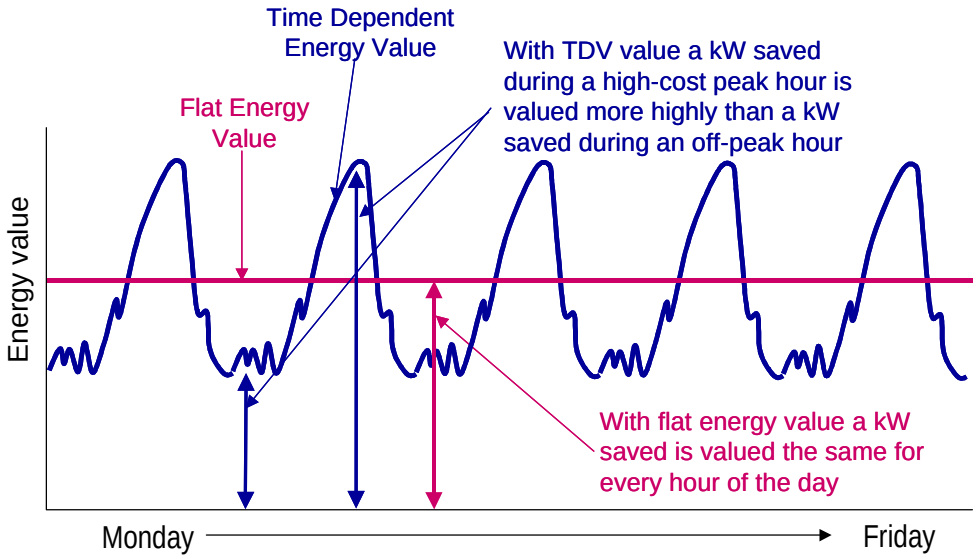
Thanks for the opportunity to participate at the meeting on March 20th and to make these comments. At the meeting, I mentioned that the California Energy Commission (CEC) was moving towards a building code system that valued on-peak energy use much higher than energy use at other times. This important ground-breaking methodology[1] has been named time dependant valuation (TDV). The purpose of this letter is to briefly describe the methodology and its application in California. The same on-peak generation and transmission issues driving the well publicized problems in California over the last several years are relevant throughout the country including many of the states in the 3500 to 6000 heating degree day range where much of the Energy Star window criteria controversy seems to lie.

Historically, the California building standards have valued a kWh of electricity using a flat source energy conversion of 10.239 which is equal to 3.413 Btu/Wh times a source energy conversion of 3. The factor of 3 was used to account for the inefficiencies of generation and distribution, a process which is about 33% efficient. Use of a site-to-source conversion is well established and a value similar to 3 was used in the Aurther D. Little study. However, current research has found that the factor of 3 seriously undervalues the true cost of electrical energy and especially the impact of building features affecting on-peak cooling energy use.

Under the new proposed TDV methodology, the source energy conversion of 3 is replaced by an hourly value based on long-term CEC forecasts for utility generation costs and utility data on transmission and distribution costs. Figure 1 illustrates the difference between flat source energy conversion and the new TDV concept:

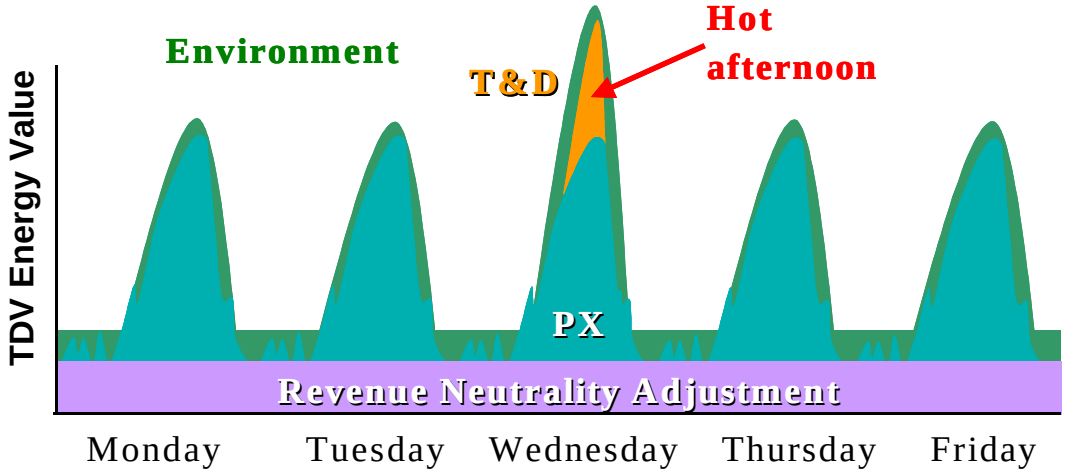
[1] The Time Dependant Valuation methodology was developed by Pacific Gas and Electric Company. Reports that describe the methodology in detail are at www.h-m-g.com and additional materials are at the California Energy Commission website at www.energy.ca.gov/2005_standards/documents. Figures 1 and 2 are from these materials

Figure 1 – How TDV Works



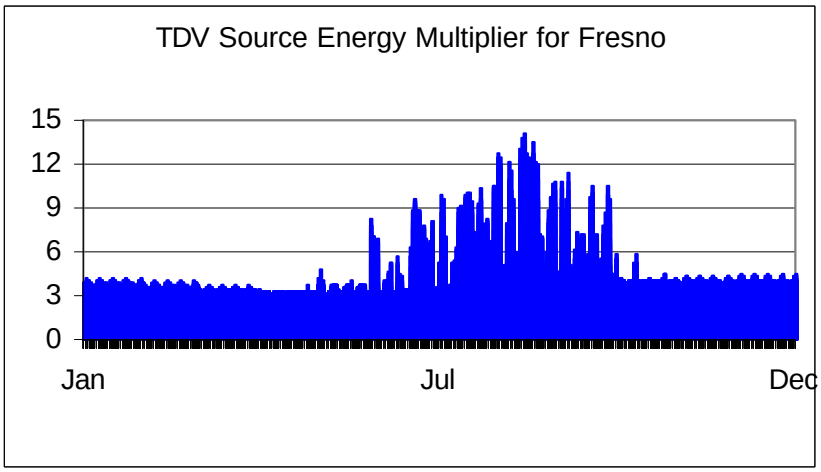
So what drives this pattern of electrical energy cost? The simple answer is the outdoor temperature. The TDV energy values are built-up from forecasts of the generation (PX) costs, plus the transmission and distribution (T&D) costs plus environmental (pollution) costs. As illustrated in the figure 2, the T&D costs are extremely sensitive to outdoor temperature.

Figure 2 – How TDV Values are Calculated



To get an idea of the shape of the TDV valuations, Figure 3 shows the TDV multipliers for Fresno for each hour of the year. For Fresno, the average TDV valuation is 3.69 with a maximum of 14.09. On a statewide basis, the average TDV valuation is 3.86 with an average maximum value of 17.59. Stated another way, the TDV value of on-peak energy is as high as 17.59 — more than 5 times higher than the old source multiplier of 3.

Figure 3 – Hourly TDV Multipliers for Fresno



While the exact numbers presented here are for California, a similar situation exists over much of the country where there are local shortages of on-peak generating capacity and transmission. These shortages seriously affect future electrical energy costs and the reliability of our nation's electric grid.

So why is this discussion relevant to fenestration products across the nation? Because the hours of maximum outdoor temperatures are the on-peak hours and are usually the same hours of maximum solar heat gain. Cutting the solar heat gain at these on-peak hours is a simple and effective way to reduce the large burden of on-peak generation costs and on-peak transmission and distribution costs. This is true for fenestration products across the United States, not just in California.

In closing, if on-peak energy use is properly valued at some multiple of its off-peak value as illustrated in the TDV methodology, then products that target reduced air conditioning energy use are clear winners to electrical energy consumers nationwide. In my opinion, moving a majority of the nation towards low solar gain low products is the right public policy decision. Therefore, I recommend that the Energy Star criteria be left at the values established last fall that requires low solar gain products in as much of the nation as possible.

Sincerely,

Ken Nittler, P.E.
Enercomp, Inc.

cc: Michael J. McCabe
Mark B. Ginsberg
Richard H. Karney